



National Weather Service
500 Weather Station Road
Old Hickory, TN 37138



TENNESSEE SEVERE WEATHER AWARENESS WEEK

February 18 – February 23, 2007

The National Weather Service, the Tennessee Emergency Management Agency and other supporting organizations are working together to help in providing the public with information about severe weather safety. Advance planning and increased awareness will help Tennesseans survive these deadly storms. **Governor Phil Bredesen** has proclaimed **February 18 - 23, 2007**, as "**SEVERE WEATHER AWARENESS WEEK**" in Tennessee.

As we move into our Spring, now is the time to prepare ourselves for the hazards and dangers associated with severe weather. Severe weather can and does occur any time of the day and anytime during the year.



An F3 (winds around 200 mph) tornado struck Gallatin, TN in Sumner County on April 7, 2007. This picture shows the damage done to a well built home.

Tennessee Severe Weather Awareness Week Events February 18 - February 23, 2007

Throughout the week, the National Weather Service, Tennessee Emergency Management Agency and other supporting groups will conduct educational activities and drills to help people prevent injuries and deaths from tornadoes, damaging winds, flash floods, lightning, and hail. Each day of the week focuses on a specific type of severe weather or on the warning and drill system.

Sunday, February 18, begins the week by highlighting SKYWARN (Amateur Radio Volunteers) and the Emergency Managers Weather Information System (EMWIN).

Monday, February 19, will look at Severe Thunderstorms. Damaging winds from severe thunderstorms are much more frequent than tornadoes in the Mid-South. These straight line winds can reach well over 100 miles an hour and can be devastating.

Tuesday, February 20, will focus on lightning, one of the underrated killers. All thunderstorms have lightning and this hazard can be deceptively deadly.

Wednesday, February 21, will emphasize Tornado Safety. Over and over again, people survive tornadic weather by knowing weather safety rules and taking appropriate and timely actions. A state-wide tornado drill will be conducted on this day. Schools and state, county, and other interested agencies are encouraged to participate and help everyone learn life saving rules. Thursday will be the alternate drill day if adverse weather is expected on Wednesday.

Thursday, February 22, draws attention to hazards of Flooding and Flash Floods. Flooding is the number one weather killer in the United States. Flash Floods are most prevalent in the east half of Tennessee while River Flooding is more common in the western sections.

Friday, February 23, will be the NOAA Weather Radio and Emergency Alert System Day.

Severe Weather Definitions

TORNADO WATCH:

Tornadoes are possible in the designated WATCH area. Remain alert for approaching storms. Keep track of the latest forecasts and be ready to take cover if severe weather threatens.

TORNADO WARNING:

A tornado has been sighted or indicated by Doppler weather radar. Warnings mean that severe weather is occurring!! **TAKE COVER IMMEDIATELY!!**

SEVERE THUNDERSTORM WATCH:

Severe Thunderstorms are possible in the designated WATCH area.

SEVERE THUNDERSTORM WARNING:

Severe Thunderstorms are occurring. Move to your planned place of safety. **Remember, Severe Thunderstorms occasionally produce tornadoes with little or no warning!!**

FLASH FLOOD or FLOOD WATCH:

Flash flooding or flooding is possible in the designated WATCH area. Be alert.

FLASH FLOOD or FLOOD WARNING:

Flash flooding or flooding has been reported or is imminent. Take necessary precautions at once.

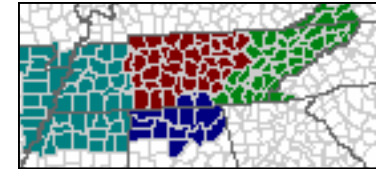
URBAN and SMALL STREAM FLOOD ADVISORY:

Flooding of small streams, streets, and low-lying areas such as underpasses and urban storm drains is occurring.

For Your Information

This booklet contains materials useful during the Severe Weather Awareness Week campaign and at other times, too. You are invited to contact the National Weather Service, state and county emergency management agencies for interviews and for answers to your questions. National Weather Service personnel and local emergency management are available for weather awareness programs to civic and industrial organizations, schools, hospitals, and others interested in weather safety.

Each county in Tennessee is served by a designated National Weather Service Office as identified here:



Legend: Nashville | Memphis | Morristown | Huntsville, AL

Please contact one of the National Weather Service Offices listed below if you need more information.

Nashville.....	Jerry Orchanian.....	(615) 754-4634
Nashville.....	Larry Vannozzi.....	(615) 754-4634
Morristown.....	Howard Waldron.....	(423) 586-8706
Morristown.....	George Matthews.....	(423) 586-6429
Memphis.....	Richard Okulski.....	(901) 544-0411
Memphis.....	Jim Belles.....	(901) 544-0411
Huntsville, AL.....	Michael Coyne.....	(256) 890-8503
Huntsville, AL.....	Tim Troutman.....	(256) 890-8503

Information Resources on the World Wide Web

For additional resources, the following web sites are available:

NWS Nashville: www.srh.noaa.gov/ohx
 NWS Memphis: www.srh.noaa.gov/meg
 NWS Morristown: www.srh.noaa.gov/mrx
 NWS Huntsville: www.srh.noaa.gov/hun
 Generic Site For All NWS Offices: <http://weather.gov>



The National Weather Service in Nashville www.srh.weather.gov/ohx

The Nashville National Weather Service Forecast Office provides a website that weather, hydrologic, and climate forecasts and warnings strictly for the Middle Tennessee area.

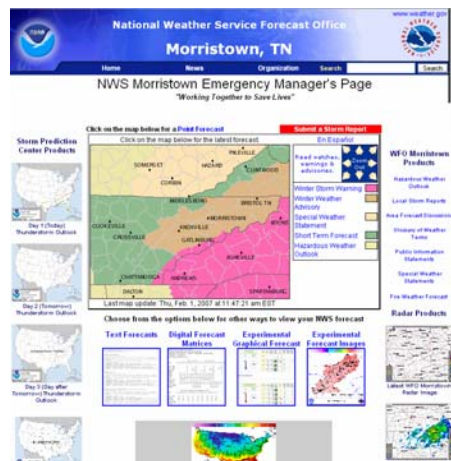
What You Will Find On Our Website:

- Warning/Watch/Advisory Plot Map Updated Every Minute
- NWS Radar of East Tennessee and Surrounding Areas
- A Web Page Designed Specifically With Spotters and Emergency Managers in Mind
- East Tennessee weather calendars
- Storm Preparedness Information
- Graphical PinPoint Forecasts - Within a 5 Mile Radius
- Detailed Text Forecasts
- Hourly Weather Graphs of Specific Point
- COOP Graphical Plots Around East Tennessee
- Extensive Climate Database
- StormReady Information
- Advanced Hydrologic Graphics and Gauging Information
- Fire Weather Information
- Tropical/Hurricane Information
- NOAA Weather Radio Sites and Frequencies
- And So Much More!



Emergency Managers Page

Our office has designed a web page with Emergency Managers and hazardous weather decision makers in mind. We have tried to include all information that these decision makers would need to stay ahead of any hazardous weather that may be approaching the region. This web page can be found at www.srh.noaa.gov/mrx/skywarn/empage.php.



StormReady is a nationwide community preparedness program that uses a grassroots approach to help communities develop plans to handle all types of severe weather, from tornadoes to tsunamis. The program encourages communities to take a new, proactive approach to improving local hazardous weather operations by providing emergency managers with clear cut guidelines on how to improve their hazardous weather operations.

The following counties are StormReady:

**Bradley
Knox**

**Jefferson
Hamilton**

To be officially StormReady, a community must:

**Establish a 24 hour warning point and emergency operations center.*

**Have more than one way to receive severe*

weather warnings and forecasts to alert the public.

**Create a system that monitors weather locally.*

**Promote the importance of public readiness through community seminars.*

**Develop a formal hazardous weather plan, which includes training severe weather spotters, and holding emergency exercises.*

For more information on what is required for your community or county, contact Howard Waldron at the National Weather Service Forecast Office in Morristown at (423) 586-8706.

StormReady information is available on the Internet website:

www.nws.noaa.gov/stormready/.

SKYWARN IN TENNESSEE The Eyes and Ears of National Weather Service in the field. Sunday, February 18, 2007



SKYWARN is the program developed by the National Weather Service to recruit and train storm spotters. SKYWARN spotters enhance the National Weather Service's storm detection capabilities by identifying and reporting potentially dangerous weather conditions. The SKYWARN program has become an invaluable link in the NWS warning process.

Despite all of the sophisticated technology used in a modern NWS office, forecasters still rely on storm spotters. Doppler radar may indicate that a storm may be producing large hail, damaging winds or even a tornado, but it cannot tell exactly what's happening on the ground underneath the storm. Storm spotters, trained by NWS meteorologists, act as the eyes and ears of the NWS. Their reports, radar data and other information result in the most timely and accurate warnings possible.

SKYWARN spotters in Tennessee come from all walks of life – law enforcement, fire or emergency management agencies and citizens interested in helping their communities. A large number of storm spotters are amateur radio operators, who volunteer their time and equipment to help the NWS detect and track severe storms. Amateur radio operators, or "hams", will frequently man radio equipment at the local NWS office, gathering reports from spotters in the field and relaying the data directly to NWS forecasters. SKYWARN spotters are volunteers – they receive no compensation for their hard work. They do, however, have the satisfaction of knowing that their reports result in better warnings which save lives. For more information on SKYWARN, or to schedule a storm spotter class in your area, contact Howard Waldron at the NWS at howard.waldron@noaa.gov or (423) 586-8706.



Severe Thunderstorm Day Monday, February 19, 2007

Severe thunderstorms can strike any time of the year. Severe thunderstorms and tornadoes are more frequent in the spring months of March, April and May. Tennessee also has a "secondary" severe weather season in November and December. Severe thunderstorms can, and do, occur anytime of the day and night and during any month of the year. Damaging thunderstorm winds are much more common in Tennessee than tornadoes.

The National Weather Service defines a thunderstorm as "**severe**" when wind speeds reach **58 mph (50 kts)** or stronger and/or 3/4 inch hail (or larger) falls from the storm. Winds from severe thunderstorms can well exceed 100 mph, overturning trailers, unroofing homes, and toppling trees and power lines. Most of the storm damage in the Mid-South is caused by "straight line winds" from thunderstorm downbursts. Severe Thunderstorm wind speeds may exceed the wind speeds of weak tornadoes. All thunderstorms are capable of producing deadly lightning.

PLEASE NOTE:

Severe thunderstorms can produce tornadoes with little or no warning!!

Severe Thunderstorm Safety Rules

FIND SHELTER IMMEDIATELY. Go to a sturdy building that will withstand high winds. Avoid electrical appliances, metal pipes and corded telephones.

When a **Severe Thunderstorm Warning** is issued for your location, treat it the same as you would a **Tornado Warning**. Remember that severe thunderstorms can produce damaging winds, large hail and deadly lightning.

Hail Size Estimates (Diameter in inches)

Pea	1/4 inch	Golfball.....	1 3/4 inch
Penny	3/4 inch	Tennis Ball...	2 1/2 inch
Quarter	1 inch	Baseball.....	2 3/4 inch
Half Dollar...	1 1/4 inch	Grapefruit...	4 inch

Wind Speed Estimates

Speed (MPH)	Effects
25-31	Large branches in motion; whistling in telephone wires
32-38	Whole trees in motion
39-54	Twigs break off of trees; wind impedes walking
55-72	Damage to chimneys and TV antennas; pushes over shallow rooted trees
73-112	Peels surface off roofs; windows broken; trailer homes overturned
113+.....	Roofs torn off houses. Weak buildings & trailer homes destroyed; large trees uprooted.



The National Weather Service in Morristown www.srh.weather.gov/mrx

The National Weather Service (NWS) is a branch of the National Oceanic and Atmospheric Administration under the United States Department of Commerce. The Weather Forecast Office (WFO) in Morristown, Tennessee is part of the Southern Region of the NWS.

WFO Morristown is managed by the Meteorologist-in-Charge (MIC), George Mathews, who is, in turn, responsible to the Director of the Southern Region. Other management personnel at Nashville include a Warning Coordination Meteorologist (WCM), Howard Waldron, Science and Operations Officer (SOO), David Hotz, Electronics System Analyst, Edward Maynard and an Observation Program Leader (OPL), Craig Carpenter.



Operational personnel include ten forecasters, whose responsibilities include issuing of severe weather warnings and statements, public (zone) forecasts and discussions, aviation forecasts (called "terminal aerodrome forecasts"), short term forecasts (called "nowcasts"), and fire weather forecasts. Service Hydrologist Brian Boyd manages the river program for East Tennessee, Southwest North Carolina, and Southwest Virginia.



The staff at WFO Morristown is supported by Information Technology Officer Eric Holweg, and two Electronics Technicians. One of the most important people in the office, yet also one of the least recognized, is the Administrative Assistant.

The forecasters are supported by four hydrometeorological technicians (HMT's). Their responsibilities include maintaining NOAA Weather Radio broadcasts, issuing various meteorological and hydrological products, and assisting

the forecaster with general duties. The HMT's also manage the cooperative program for East Tennessee, Southwest North Carolina, and Southwest Virginia.

WFO Morristown has warning responsibility for thirty-three counties across East Tennessee, two counties in Southwest North Carolina and five counties in Southwest Virginia. The county warning area generally extends from the Cumberland Plateau in the west to the Appalachians in the east. The Morristown county warning area comprises 15,982 square miles with a population of 2,369,422 (U.S. Census Bureau, 2002).

In September 2003, WFO Morristown was awarded the United States Department of Commerce Silver Medal Award for superior federal service "for providing timely and accurate severe weather warning services during the November 10, 2002 tornado outbreak in East Tennessee."

You can telephone the office at (423) 586-3771 24 hours a day should you have questions.

www.srh.weather.gov/mrx

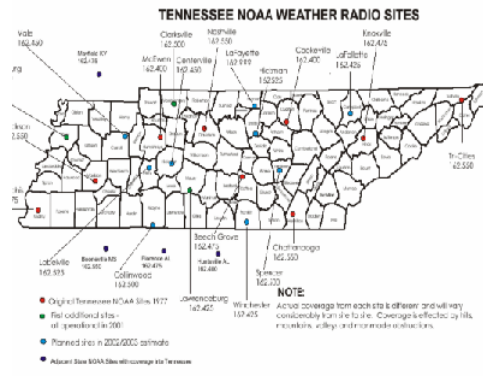
Friday, February 23, 2007

In an emergency, each station will transmit a warning alarm tone signal as well as the SAME (Specific Area Message Encoding) codes, followed by information on the emergency situation. These signals are

Commercial radio and television stations as well as cable television companies are encouraged to use NOAA Weather Radio and may freely rebroadcast Weather Radio broadcasts. NOAA Weather Radio is also a major part of the Emergency Alert System (EAS) with improved technology to speed critical weather warning information through commercial broadcast outlets.



Location	Frequency
Knoxville	162.475 MHz
Chattanooga.....	162.550 MHz
Tri-Cities	162.550 MHz
LaFollette	162.450 MHz



Do you know what group of people are most likely to get struck by lightning? It is farmers, followed then by golfers.

Keep in mind that you do not have to be standing directly beneath a cloud to be hit. Lightning may strike many miles from the parent storm. In an average year lightning will claim more victims than tornadoes or hurricanes.

Lightning Safety Rules (Continued) - Indoors



Stay away from windows. Avoid telephones and electrical appliances (wires connecting to these devices run outside of the home and act as lightning rods). Don't wash dishes or take a shower. The pipes will conduct electricity.

Unplug computers and other sensitive electrical devices (time permitting) since surge suppressors may not protect these items if lightning hits close to the home.

Remember, there is no truth to the old myth that "lightning never strikes twice."

Take time this week to learn or refresh your memory on lightning safety rules. That quick dash out in the open when a thunderstorm is in progress may unnecessarily expose you to the possibility of being struck. It is not worth the risk.

Large Hail—An Added Hazard



The strong rising currents of air within a storm, called updrafts, carry water droplets to a height where freezing occurs. Ice particles grow in size and become too heavy to be supported by the updraft and then fall to the ground as hail. Large hailstones may fall at speeds faster than 100 mph. Light reflecting from the large hail high up in the storm often gives the storm an eerie yellow green color. This is an indication that this storm may be strong.

Hail rarely causes deaths, but injuries do occur. If you are outside, move inside a building or a car with a hard top. Make sure that outdoor pets and other animals have access to shelter.



The Mission of Your National Weather Service

The National Weather Service (NWS) provides weather, hydrologic, and climate forecasts and warnings for the United States, its territories, adjacent waters and ocean areas, for the protection of life and property and the enhancement of the national economy. NWS data and products form a national information database and infrastructure which can be used by other governmental agencies, the private sector, the public, and the global community.

To get more information about our products and services, go to our website at:
www.srh.weather.gov/mrx



RIVER FLOODING: This type of flood is caused by an increased water level in an established watercourse, such as a river, creek, or drainage ditch. River flooding is generally slower to develop than flash flooding. There can be exceptions to this, especially with some smaller rivers where the time lag between the runoff

from heavy rain and the onset of flooding can be very short. This can be the case with several east Tennessee rivers and streams. On the other hand, it may take several days for a flood crest to pass downstream points on major rivers.

The National Weather Service issues **River Flood Warnings** when rivers are expected to rise above flood stage in less than six hours. Persons in the warned area are advised to take necessary precautions immediately. River stages and crest forecasts are given for selected forecast points along with known flood stages for each forecast point.

While there is usually more advanced warning time with river floods than with flash floods, persons should be familiar with the flood prone areas they live and work in, and must know what action to take and where to go if a flood occurs. Advance planning and preparation is essential.

FLOOD SAFETY RULES:

Get out of areas subject to flooding. These include dips, low spots, stream beds, drainage ditches and culverts. If caught in low areas during flooding, go to high ground immediately.

Avoid already flooded and high velocity flow areas. A rapidly flowing stream or ditch can sweep you off your feet or even sweep your car downstream.

Be especially cautious at night when it is harder to recognize flood conditions.

Do not drive through flooded areas. The road bed may be washed away. Play it safe. **TURN AROUND, DON'T DROWN!**

If your vehicle stalls, abandon it immediately and seek higher ground. The rising water may engulf the vehicle and the occupants inside.

Do not camp or park your vehicle along streams or washes during threatening conditions.

When a Flash Flood WARNING is issued for your area act quickly to save yourself. You may only have seconds.

Flash Flooding and River Flooding

Thursday, February 22, 2007

Flooding and Flash Flooding are the number one weather related killer!



Most flood deaths occur at night and when people become trapped in automobiles that stall in areas that are flooded.

Flash floods occur within a few minutes or up to 6 hours after excessive rainfall, a dam or levee failure, or a sudden release of water held by an ice jam or mud slide. Flash floods can tear out trees and destroy buildings and bridges.

Because flash floods happen in a short period of time, generally less than six hours, they are more life threatening than general floods or river flooding. Areas most susceptible to flash flooding are mountainous streams and rivers, urban areas, low-lying areas, storm drains, and culverts. The mountain regions of middle and east Tennessee have potentially more flash flood problems than west Tennessee but all parts of the state are susceptible.

The National Weather Service issues a **Flood Watch** when conditions are detected that can result in either flood or flash flooding within a designated area, but the occurrence is neither certain nor imminent.

Persons in the watch area are advised to check flood action plans, keep informed, and be ready to take action if a warning is issued or flooding is observed.

A **Flash Flood Warning** is issued when flash flooding has been reported or is imminent. It focuses on specific communities, streams or areas where flooding is imminent or occurring.



TORNADO AWARENESS AND DRILL DAY WEDNESDAY, FEBRUARY 21, 2007

Tornadoes...What Are They?

Nature's Most Violent Storms!

A **TORNADO** is a violently rotating column of air extending from the base of the thunderstorm and in contact with the ground (when it is not in contact with the ground, it is called a **FUNNEL CLOUD**). Tornado winds average 100 mph, but can exceed 300 mph. The strongest tornadoes develop from severe thunderstorms in atmospheric conditions with a wind profile that varies with height. Severe thunderstorms and tornadoes occur most often in the Mid-South in the months of March, April, and May. A secondary season occurs in the Fall, typically November and December. Most tornadoes occur in the afternoon and evening. However, tornadoes have occurred in every hour of the day and night and every month of the year. No location, time of day, or time of year is immune to tornado occurrences.



Know the difference between a

TORNADO WATCH and a **TORNADO WARNING.**

A **TORNADO WATCH** means tornadoes may develop, so keep an eye to the sky for thunderstorms and the dangers they pose. Listen to NOAA Weather Radio, commercial radio, or TV for weather statements or warnings. A **WATCH** allows time to plan what to do if a tornado approaches. A watch usually spans several thousand square miles, and can cover parts of more than one state.

A **TORNADO WARNING** means a tornado has been sighted, or is indicated on weather radar.

Persons in the path of the tornado should seek shelter immediately

Your **Safety** will improve if you stay alert to the risk of tornadoes from thunderstorms that approach. This is especially true if a **TORNADO WATCH** is in effect. Conditions should be carefully monitored when severe thunderstorms are occurring, or are expected to occur.

Severe Thunderstorms can produce tornadoes with little or no warning.

Enhanced Fujita Intensity Scale (EF Scale)

Dr. T. Fujita, was the noted meteorologist who has studied tornadoes extensively and classified the damage created by these storms and developed the original Fujita Scale back in 1971.

EF-Scale	Speed	Damage Threat
EF0 (weak)	65-85 mph	Light damage...shallow rooted trees pushed over.
EF1 (weak)	86-110 mph	Moderate damage...mobile homes overturned; roof surfaces peeled off.
EF2 (strong)	111-135 mph	Considerable damage...large trees uprooted...mobile homes destroyed
EF3 (strong)	136-165 mph	Severe damage...trains overturned; well built homes lose roofs and walls
EF4 (violent)	166-200 mph	Devastating damage...well built homes leveled; cars tossed about
EF5 (extreme)	>200 mph	Incredible damage...well built homes disintegrate; cars thrown.

Drill Day Wednesday, February 21, 2007 9:00 - 9:30 Local Time

A **TORNADO DRILL** will be conducted Wednesday morning, February 21, 2007, between 9:00 AM and 9:30 AM **Local Time**, weather permitting, as part of SEVERE WEATHER AWARENESS WEEK in Tennessee. *If Wednesday's weather is inclement, the test will be Thursday, February 22, 2007 (same times).*

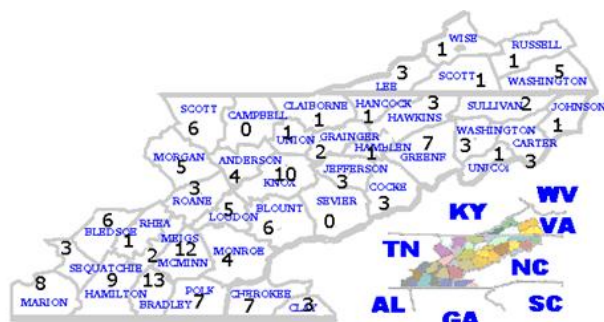
Sometime during this hour, each National Weather Service office in the state will issue a test tornado drill message. The message will be sent under the Weekly Test Product (RWT) disseminated by NOAA Weather Radio and the EAS alert system.

The Weekly Test Product, with the tornado drill message, will be broadcast on all NOAA Weather Radio Transmitters across Tennessee and those transmitters in North Mississippi that cover Tennessee counties.

A **Drill** such as this gives schools, churches, business offices and plant safety managers across the state a chance to check the readiness of their Severe Weather Safety plans. If your office has a plan already in place, test it to make sure your employees know how to respond properly. If your employees know how the safety procedures work, they can carry them out effectively when the time comes.

IF YOUR WORK PLACE, SCHOOL OR CHURCH DOES NOT HAVE A SAFETY PLAN, NOW IS THE TIME TO START ONE!! Developing a safety plan is not difficult. If a plan is easy to operate, it is more likely to be successful when needed. Countless lives are saved each year by planning, preparedness and proper education. The U.S. population has grown in recent years, yet the number of tornado deaths has diminished. This is due to agencies and individuals developing Weather Safety Plans and to people reacting in a prudent manner when severe weather threatens their areas.

**YOUR SAFETY AND THAT OF YOUR FAMILY, FRIENDS & CO-WORKERS
DEPENDS ON YOU!!**



Tennessee averages about 28 tornadoes each year, resulting in about 1 or 2 fatalities. Our peak season for tornadoes is during March, April and May, and they are most likely to occur between 3 PM and 9 PM. A secondary maximum of tornadoes will occur in November and December, of which we have had a sad reminder on November 10, 2002.

In the year 2006, the entire

State of Tennessee experienced 32 tornadoes, with 34 fatalities.

No place is immune to tornadoes. Tornadoes have been known to occur at all hours of the day or night and at any time of the year.

Details of Tennessee storms since 1950 can be found at this National Climatic Data Center Website:

<http://www4.ncdc.noaa.gov/cgi-bin/wwwcgi.dll?wwevent~storms>



Every state, in the United States, has reported a tornado. Even Yellowstone National Park had a tornado at an altitude of 10,000 feet on July 21, 1987. This F4 tornado had a path length of 24 miles and a path width of 1.4 miles. 15,000 acres of trees were downed.

The average tornado moves from southwest to northeast, but tornadoes have been known to move in any direction. The average forward speed is 30 mph but can vary from nearly stationary to 70 mph.

The "Tri-state Tornado" on March 18, 1925, was one of the worst tornadoes on record. This F5 tornado had a path length of 219 miles, had an average forward speed of 62 mph and was on the ground for about 3 1/2 hours. The tornado started in southeast Missouri, roared through southern Illinois and ended in southwest Indiana. There were 695 deaths. 234 deaths occurred in the town of Murphysboro, IL, which made it the largest death toll within a single city, in U.S. history.

A listing of tornadoes, by state, can be found at the website of the National Climatic Data Center at

www.ncdc.noaa.gov/

There is an extensive tornado database for Middle Tennessee at our website:

www.srh.weather.gov/ohx/

Tennessee Tornadoes 1950-2005

